

ABSTRACT OF THE DISCLOSURE

Semiconductor devices with improved data retention are formed by depositing an undoped oxide liner on spaced apart transistors followed by in situ deposition of a BPSG layer. Embodiments include depositing an undoped silicon oxide liner derived from TEOS, as at a thickness of 400Å to 600Å, on transistors of a non-volatile semiconductor device, as by sub-atmospheric chemical vapor deposition, followed by depositing the BPSG layer in the same deposition chamber.